fascia. The femora, as well as the tibiæ and tarsi, are rufous. Beneath, the colour of the abdomen is shining black, with yellow belts across the segments.

Dere thoracica, White.

Dere thoracica, White, Cat. Long. Col. Brit. Mus. p. 249, pl. 8. f. 1.

On flowers in June. Found also in N. China.

Purpuricenus Temminckii, Guérin-Ménev.

Sternoplistes Temminckii, Guérin-Ménev. Icon. R .A. Ins. texte, p. 224.
P. sinensis, White, Cat. Long. Col. Brit. Mus. p. 139.
P. japanus, Motsch. Etud. Entom. 1857, p. 37.

Not uncommon in Japan; also N. China.

The conical tubercle of the mesosternum being present in other species of the genus, there is no reason for retaining *Sternoplistes* of Guérin. As to the form of the thorax, short and transverse, *Purpuricenus* including a great diversity of form of this organ (e. g. *P. Angasii*, White), this character is quite insufficient as a generic difference.

Purpuricenus spectabilis, Motsch.

Purpuricenus spectabilis, Motsch. Etud. Entom. 1857, p. 36.

Mr. Lewis did not meet with this species (or variety?), which is distinguished from *P. Temminckii* (according to the description) only by the suture and a point on the posterior disk of the elytra being black. I have a specimen of *P. Temminckii* possessing the black discoidal point, but none in which the suture is black.

[To be continued.]

XXVI.—*On the Primary Divisions of the Brachiopods.*

By Theodore Gill, M.A., M.D., Ph.D.

The article in the July number of the 'Annals & Magazine of Natural History' (xii. pp. 1–17), by Prof. King, on *Lingula*, exhibits the insight into relations and skill in discussion characteristic of its author; and his views respecting the classification of the Palliobranchs or Brachiopods into two primary groups will probably be accepted. Indeed they had already been quite generally adopted; but as Prof. King had overlooked the fact, it is presumed that it is not as well known as might have been supposed; and the object of this note is to direct attention to the anticipation by others of Prof. King's views. The essential distinctions of Prof. King's groups are that in one (*Tretentcrata*) the intestine has an anal aperture,

and in the other (*Clistenterata*) none. With these characters, be it remarked, are *generally* coincident structural modifications of the hinge of the shell—the species with an anal aperture having an inarticulating hinge generally, and those without the anal aperture having a more or less interlocking one. On one or other (or both) of these characters (and with coordinate ones) these groups have been repeatedly recognized, first by Owen, and then by Bronn, Huxley, and others. Owen, it is true, vigorously opposed the assertion that any forms had a cæcal intestine; but the groups he recognized were, as to their constituents, exactly equivalent to the Tretenterates and Clistenterates, although based only on the simple or interlocking hinge and relative proportions of the viscera and brachia. All other naturalists who have adopted the groups, however, have especially recognized the perforation or non-perforation of the intestinal tube in their diagnoses; and the groups have been adopted by the following naturalists, viz.:—

I.

Lyopomata, Owen, Encycl. Brit. 8th edit. vol. xv. p. 301, 1858*.
Pleuropygia seu *Ecardines*, Bronn, Klass. u. Ordn. Thierreichs, p. 301, 1862†.
Inarticulata, Huxley, Int. Class. An. p. 116, 1869‡.
Lyopomata, Gill, Arr. Fam. Moll. p. 26, 1871; Dall, Am. Journ. Conch. vol. vii. p. 71, 1871.
Tretenterata, King, Ann. & Mag. N. H. (4) vol. xii. p. 15, 1873.

II.

Arthropomata, Owen, Encycl. Brit. 8th edit. vol. xv. p. 336, 1858§.
Apygia seu *Testicardines*, Bronn, Klass. u. Ord. Thierreichs, p. 301, 1862‖.
Articulata, Huxley, Int. Class. An. p. 116, 1869¶.
Arthropomata, Gill, Arr. Fam. Moll. p. 25, 1871; Dall, Am. Journ. Conch. vol. vii. p. 60, 1871.
Clistenterata, King, Ann. & Mag. N. H. (4) vol. xii. p. 15, 1873.

The conclusions of Prof. King (he being unaware of the labours of his predecessors) are noteworthy, as being inde-

* "Shell-valves inarticulated, and, save in the annectant family *Craniadæ*, subcalcified; viscera occupying one half, brachia the other half, of the shell-cavity" (*l. c.* p. 339).

† "Nahrungskanal (in den fossilen Sippen nur vermuthungsweise) lang, gewunden, durch einen After (rechterseits?) ausmündend," &c. (*l. c.* p. 301).

‡ "The intestine terminates in an anus on one side of the body" (*l. c.* p. 116).

§ "Shell-valves articulated, calcareous; viscera occupying one third, brachia two thirds, of the shell-cavity" (*l. c.* p. 336).

‖ "Nahrungskanal (bei den ganz fossilen Familien nur vermuthungsweise) mit einfachem abwärts gebogenem blind endigendem Darm-Anhange (Afterlose)," &c. (*l. c.* p. 301).

¶ "The intestine ends in a blind sac" (*l. c.* p. 116).

pendent corroboration, by an acute naturalist, of the importance of the groups in question; but it will be obvious that, if we follow the rules of priority, the names of Owen must be adopted; and even if we feel obliged to accept more characteristic names (those based on intestinal characters), Bronn's excellently chosen ones had already long existed, and there is no obvious reason why they (if any should supersede Owen's) should not be adopted.

Smithsonian Institution,
July 28, 1873.

XXVII.—*Notes on the Siliceous Spicules of Sponges, and on their Division into Types.* By Dr. J. E. Gray, F.R.S. &c.

The existence of spicules was mentioned by Ray, Ellis, and others; but I believe that Savigny was the first zoologist who exhibited them *in situ* in living sponges, in Napoleon's great work on Egypt—though, like many of the plates drawn by Savigny in that work of imperial ostentation, confined to the libraries of the few, the figures were without text, as the object for which the Emperor had undertaken the work was past. These figures have been greatly overlooked by zoologists, and the importance of the spicules in the determination of species and genera has only been more recently recognized.

Savigny, in the plates of the work above-mentioned, which he executed in 1805 to 1812, letters his plates "Eponges charnues," "Eponges à piquans," and "Eponges à réseau," and gives admirable figures of the spicules forming the second division, and of the horny skeletons of his "Eponges à réseau." The figures of the sponges are superior to any thing that has been done since. These groups were afterwards regarded as genera:—1. *Halisarca*; 2. *Halichondria*; 3. *Spongia*.

Prof. Ehrenberg names the spicules of these sponges as if he were describing a perfect animal or the shell of a mollusk, and gives to each kind of spicule a generic and specific name! overlooking the fact that there are several forms (and therefore what he considers different genera and species) of spicules in the same species of sponge.

Dr. Bowerbank, in his paper in the 'Philosophical Transactions,' which was reprinted and forms the first part of his work on British Sponges, figures a number of the different forms which these spicules assume, and names them, but in an irregular manner; and some of the names are of extraordinary length and composition. He gives different names to